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**From:** Strynar, Mark [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5A9910D5B38E471497BD875FD329A20A-STRYNAR, MARK]  
**Sent:** 2/4/2019 1:24:54 PM  
**To:** Zhang, Zhenfa [zhenfaz@email.unc.edu]; Surratt, Jason D. [surratt@unc.edu]; Lang, Johnsie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b220365e540947f7a7c55cde0904f73e-Lang, Johns]  
**CC:** Bodnar, Wanda M [wanda\_bodnar@unc.edu]  
**Subject:** RE: update on synthesis  
**Attachments:** Strynar et al., 2015 ES&T.pdf; strynar et al., 2015 SI.pdf

I think Hydro-EVE is a next best analyte.

We did not identify Hydro-EVE in my 2015 paper (see attached) we simply noted it internally as the paper was in galley proof stage when we figured it out. We also did not monitor for it in the Sun et al., paper. The structure is definitive and we have a small aqueous standard supplied by Chemours. The CAS is 773804-62-9. It is a byproduct of manufacture line but I am not sure which one.

I can put you in touch with my contact.

Mark

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**From:** Zhang, Zhenfa <zhenfaz@email.unc.edu>  
**Sent:** Friday, February 01, 2019 8:27 PM  
**To:** Strynar, Mark <strynar.mark@epa.gov>; Surratt, Jason D. <surratt@unc.edu>; Lang, Johnsie <lang.johnsie@epa.gov>  
**Cc:** Bodnar, Wanda M <wanda\_bodnar@unc.edu>  
**Subject:** Re: update on synthesis

Mark,

I am thinking of making Hydro-EVE as the next target standard since it is on the the most abundant list in blood. I suppose this pollutant is also come from a industrial intermediate or product, would your friend know if there is a way we can access such a thing? Thank you,

Zhenfa

PS: You must know if the Hydro-EVE structure is tentative or definitive, I didn't find the original publication on the identification of this compound, would you please point to me the direction? Thank you,

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**From:** Strynar, Mark <Strynar.Mark@epa.gov>  
**Sent:** Monday, January 28, 2019 12:14:10 PM  
**To:** Zhang, Zhenfa; Surratt, Jason D.; Lang, Johnsie  
**Cc:** Bodnar, Wanda M  
**Subject:** RE: update on synthesis

Zhenfa,

I have a contact who is a retired DuPont chemist who could help if we have any further questions. Glad to hear you have made some very good progress. Not sure how much we need, however more is better so we can share it with others.

Mark

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**From:** Zhang, Zhenfa <[zhenfaz@email.unc.edu](mailto:zhenfaz@email.unc.edu)>

**Sent:** Monday, January 28, 2019 11:55 AM

**To:** Strynar, Mark <[strynar.mark@epa.gov](mailto:strynar.mark@epa.gov)>; Surratt, Jason D. <[surratt@unc.edu](mailto:surratt@unc.edu)>; Lang, Johnsie <[lang.johnsie@epa.gov](mailto:lang.johnsie@epa.gov)>

**Cc:** Bodnar, Wanda M <[wanda\\_bodnar@unc.edu](mailto:wanda_bodnar@unc.edu)>

**Subject:** RE: update on synthesis

Hi Mark,

Thank you for coping me in your message. I assume I started with the same monomer precursor you acquired(CAS4089-58-1), it took quite some time for us to get that. I actually spent that time trying to make that monomer precursor myself while I was waiting for that to come, but stopped doing that after I got it from the supplier. The monomer precursor is not so easy to make pure in small quantity so I think it is better to leave that to the supplier if we don't have to work with large quantity.

Since I talked with Jason the other day, I am pleased to see some more progress is made with the synthesis of Nafion BP2, and I got some product already as I told Jason last week. It still needs some final purification and characterization. Basically put a number on the purity. There is some diglyme solvent that is surprisingly resistant to freeze dry. After tested some solvent extraction and failed to improve, I repeatedly did freeze dry. Calculated from NMR that is just a few percent, so I guess we will live with it for now, till we find a way to improve later on. For that matter, I am just trying to find an internal standard for NMR calculation of purity, we can have your precursor if you still have some since I exhausted ours unaware of the need in the beginning. Thanks,

Zhenfa

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**From:** Strynar, Mark <[Strynar.Mark@epa.gov](mailto:Strynar.Mark@epa.gov)>

**Sent:** Monday, January 28, 2019 8:47 AM

**To:** Surratt, Jason D. <[surratt@unc.edu](mailto:surratt@unc.edu)>; Lang, Johnsie <[lang.johnsie@epa.gov](mailto:lang.johnsie@epa.gov)>

**Cc:** Bodnar, Wanda M <[wanda\\_bodnar@unc.edu](mailto:wanda_bodnar@unc.edu)>; Zhang, Zhenfa <[zhenfaz@email.unc.edu](mailto:zhenfaz@email.unc.edu)>

**Subject:** RE: update on synthesis

Jason,

Back to work today and hoping to pick this up. We have acquired 5 grams of the Nafion Monomer precursor we think would make the synthesis to Nafion BP2 easier.

Lets have a chat when you get a chance.

Mark

**From:** Surratt, Jason D. <[surratt@unc.edu](mailto:surratt@unc.edu)>  
**Sent:** Wednesday, January 09, 2019 1:27 AM  
**To:** Strynar, Mark <[strynar.mark@epa.gov](mailto:strynar.mark@epa.gov)>; Lang, Johnsie <[lang.johnsie@epa.gov](mailto:lang.johnsie@epa.gov)>  
**Cc:** Bodnar, Wanda M <[wanda\\_bodnar@unc.edu](mailto:wanda_bodnar@unc.edu)>; Zhang, Zhenfa <[zhenfaz@email.unc.edu](mailto:zhenfaz@email.unc.edu)>  
**Subject:** update on synthesis

Hi Mark,

Hope this email finds you well and happy new year! I'm finally back to work this week!  
I took a couple of weeks off to travel and be with family during the latter part of last year.

I spoke with Zhenfa here at UNC. As you know, he is our in house organic synthetic chemist. He has been working on the synthesis of Nafion BP2. Right now he tells me he is very close to getting the Nafion BP1 compound; however, as you know the Nafion BP2 is much more difficult. He is getting more confident though that he will be able to get to Nafion BP2. As of right now, we can't say an exact date as to when we can get enough material in high purity to share.

How much of the Nafion BP2 were you hoping to get? I know you are also interested to know the exact method he develops for getting Nafion BP2. I think you also have interest in doing this synthesis yourself at EPA.

Best wishes to you, Jason

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Jason D. Surratt, Ph.D.  
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